Practice-based insights from UK collaboration projects between a university and communities: ideas for school-based learning through citizen science

Conference or Workshop Item

Practice-based insights from UK collaboration projects between a university and communities

ideas for school-based learning through citizen science

Janice Ansine, Senior Project Manager – Citizen Science
Faculty of STEM, The Open University, UK

janice.ansine@open.ac.uk @janiceansine @iSpotnature @Treezilla_org @OpenUniversity

STEM Education Hub event, August 11, 2021

Presentation Outline

- The Open University and citizen science
- OU biodiversity citizen science projects summaries
- Evolution Megalab
  - Engaging schools in research
- iSpot your place to share nature
  - iSpot participation, engagement and learning
  - School-based experiences: iSpot projects
  - Support: Citizen science and Global biodiversity course
  - Join a live and growing online community
- Treezilla: creating a UK map of trees
  - Contribute to the monster map of trees
  - School-based experiences : student –led research
- X:PolliNation: ideas, methods & technologies for pollinator citizen science
  - XPolli actionable CS cycle
  - School-based experiences support: resources for all
- Cos4Cloud, an European project to boost citizen science technologies
  - What is a citizen observatory?
  - Join the Cos4Cloud community
- iSpot citizen science learning curve
  - CS learning design five-step model
- OU online citizen science learning communities - *opportunities for school-based learning*

OU citizen science, research and learning

The OU:

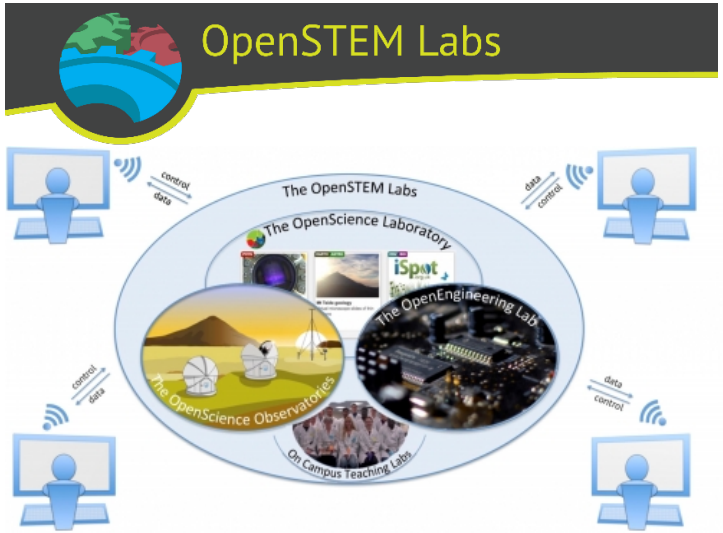
- Britain's main e-learning institution, leader in distance learning
- Develops innovative educational technology
- Integrates citizen science, open science, practical science (online) within STEM pedagogy

Citizen Science research

- Monitoring, classifying and collecting data at scale
- Infrastructure for collating and analysing data
- Citizen science, policy and action

Citizen science learning and teaching

- Collaborative and informal learning opportunities
- Opportunities for student projects
- Citizen inquiry



Knowledge exchange

- Outreach and public engagement
- Building new collaborations

OU biodiversity citizen science projects

EVolution MegaLab	European-wide citizen science project on species evolutionary trends recording snails.	2009
iSpot ispotnature.org	**www.iSpotnature.org Your place to share nature: sharing & learning about wildlife, while building species identification skills.**	
The OpenScience Laboratory	Practical science, online experiments, citizen science activities etc. www.opensciencelab.ac.uk	2013
Treezilla The monster map of trees	**The monster map of trees: cataloguing UK trees, calculates ecosystem service values www.Treezilla.org**	
X-POLLI:NATION	**Cross pollinating ideas, methods and technologies for pollinator citizen science: https://xpollination.org**	2019
Cos4Cloud	**Co-designed Citizen Observatories Services for the European Open Science Cloud: a European project to boost citizen science technologies www.cos4cloud-eosc.eu/**	2020
DECIDE Recording nature where it matters	DECIDE: Recording nature where it matters https://www.ceh.ac.uk/our-science/projects/decide	
SENSE	Sensory Explorations of Nature in School Environments http://kmi.open.ac.uk/projects/name/sense	2021

Evolution MegaLab project

- **Scale:** European, 14 countries
- **Timeline:** 2009 – 2010: 200th anniversary Darwin's birth; 150th anniversary of *Origin of Species*
- **Focus:** public survey of banded snails
- **Aim / hypothesis:** evolutionary responses to climate change
- **Website features:** historic records 1930 – 1980; new data posted by the public
- **Engagement, teaching & learning:** Quizzes, ID guides, school activities, events & activities; media; different languages

Engaging schools in research

~ 5,000,000 total media outreach (UK only)

71,232 hits to website

6461 registered users

2472 users submitted a record

7629 records submitted

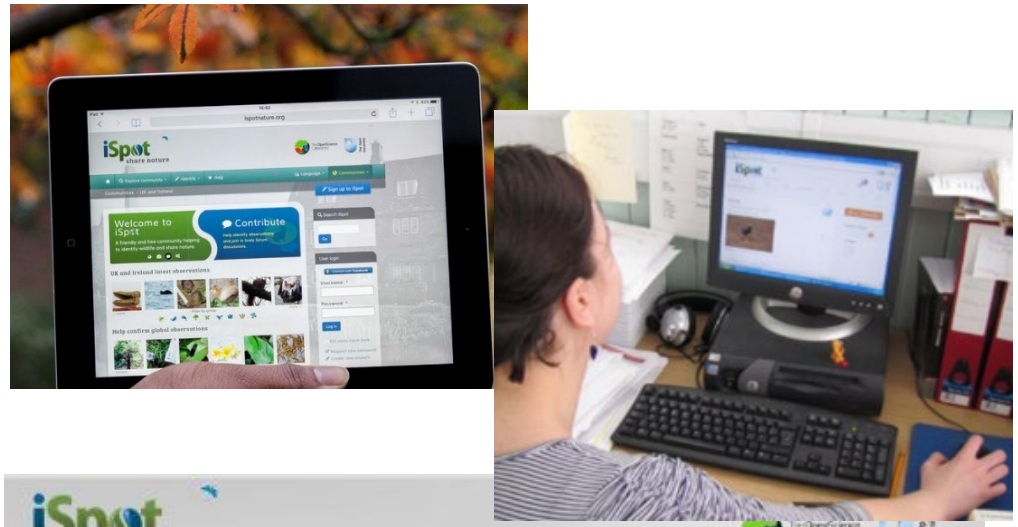
public, schools, universities scientists

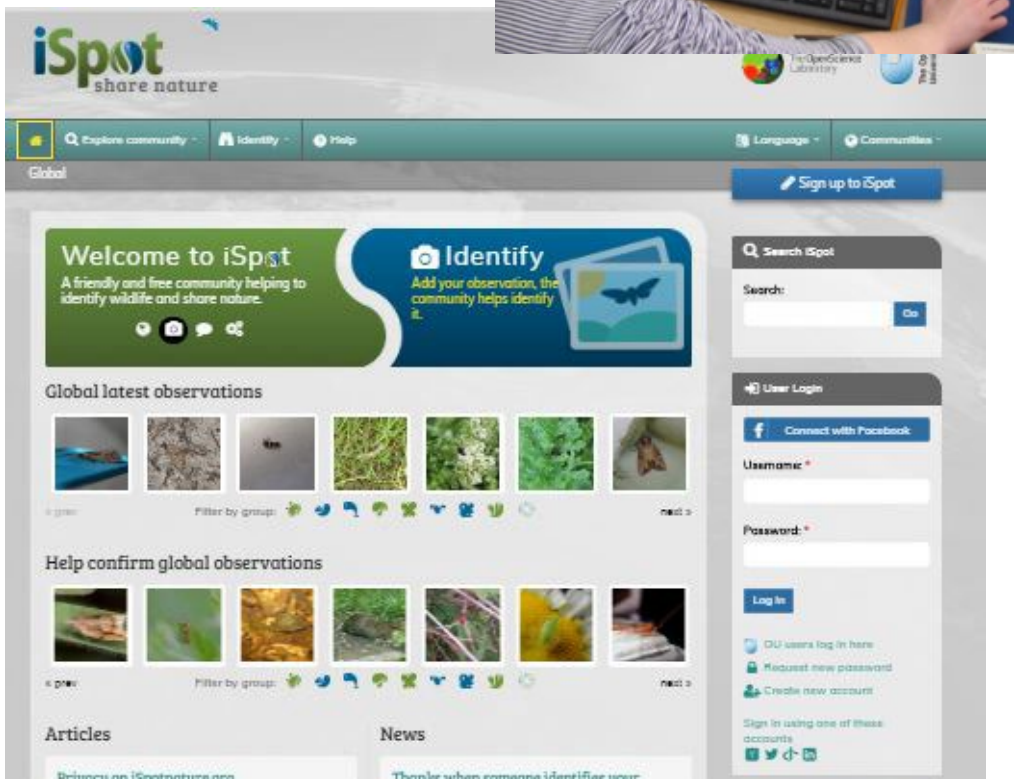
Worthington, J.P., et al (2011) Evolution MegaLab: a case study in citizen science methods
https://besjournals.onlinelibrary.wiley.com/doi/epdf/10.1111/j.2041-210X.2011.00164.x

iSpot: your place to share nature

www.iSpotnature.org: A citizen science platform for **identifying** and **learning** about biodiversity. Anyone can upload a photo and the community of users help to identify it.

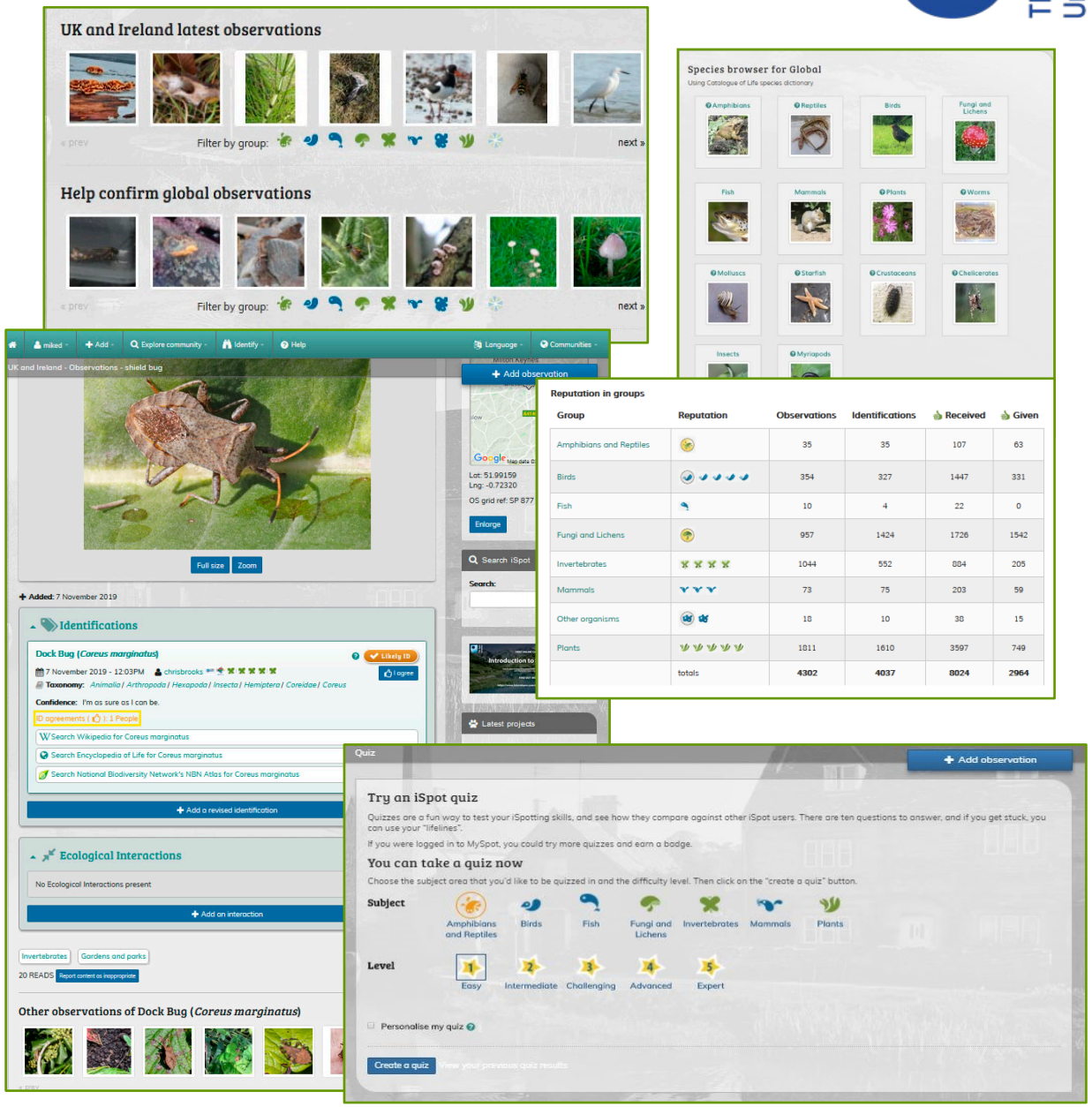
- **Scale**: UK / Global citizen science platform for biodiversity
- **Timeline:** 2009 – ongoing
- **Aims:**
  - Lower barriers to ID – build ID skills
  - Make nature accessible / open to all
  - A new generation of naturalists
  - Biological data recording
- **Website features: global,** national species dictionaries, innovative technology, integrated tools etc
- **Engagement, teaching & learning:** Media, radio & TV (OU/BBC), social media, events & activities with schools, community groups etc (iSpot Mentors); tools, resources and courses contributing to informal and formal learning





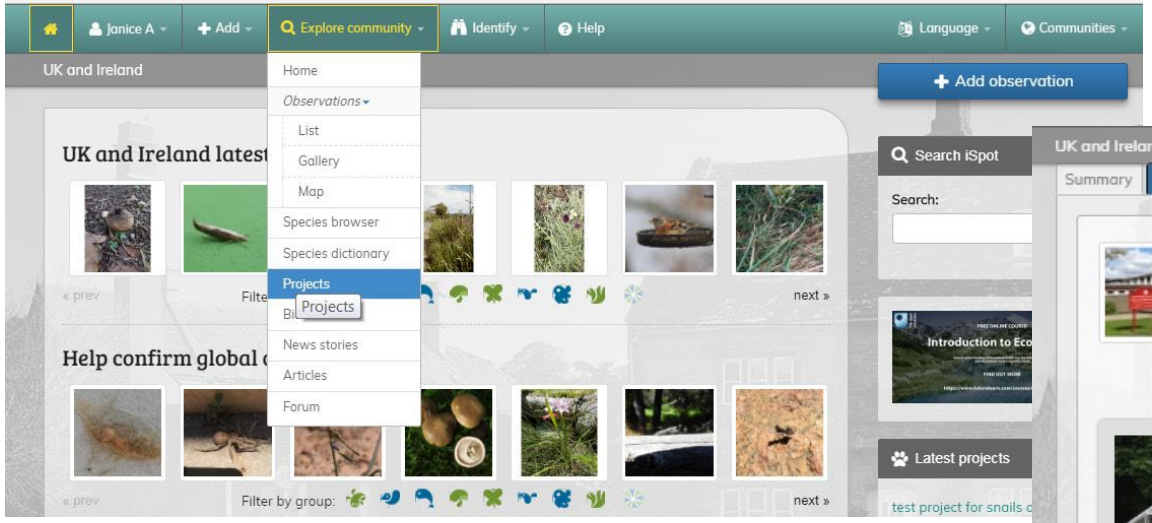
iSpot participation, engagement, learning

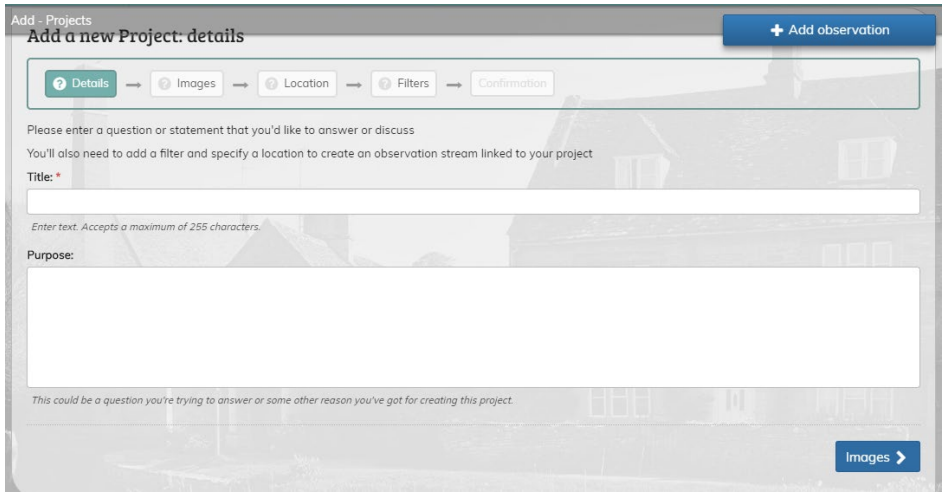
- **Explore:** Browse iSpot observations
- **Identify:** Register & post, use species dictionary & browser, etc
- **Contribute:** Give IDs, agreements, comments, forums, gain reputation points
- **Personalise:** create project filters, collate your observations
- **Recognition:** quizzes (assessment) & courses, etc

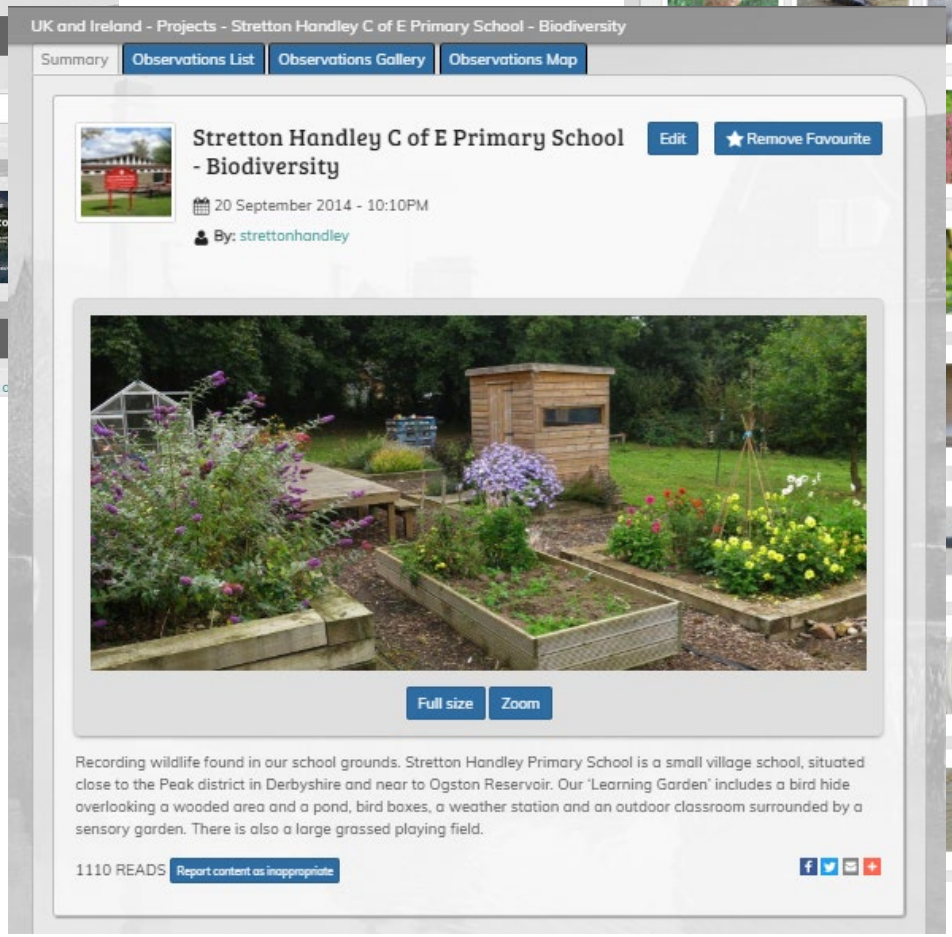


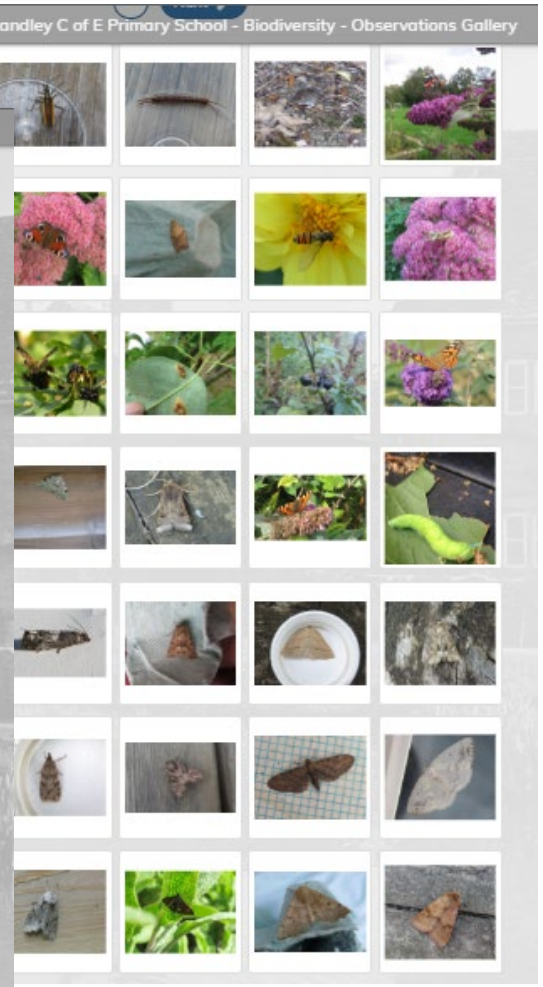
School-based experiences: iSpot Projects

Create filters to view, collect, collate, share, propose research queries and learn







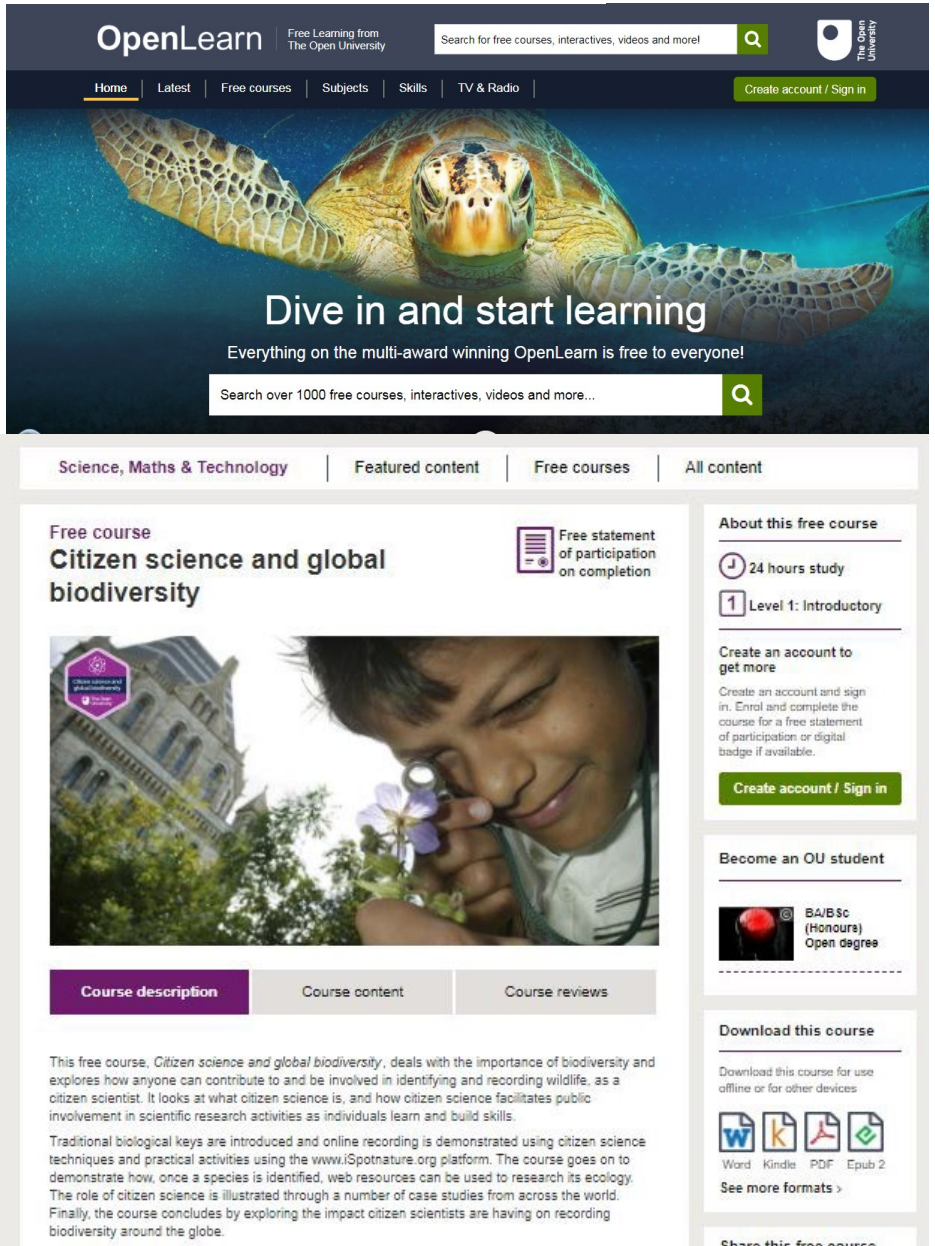


Stretton Handley Primary School – Biodiversity project: www.ispotnature.org/communities/uk-and-ireland/view/project/284782/stretton-handley-c-of-e-primary-school-biodiversity

Support: Citizen science & Global Biodiversity Course

OpenLearn (www.open.edu/openlearn**):** Free 8 week Badged Open Course (BOC)
Citizen science and global biodiversity: www.open.ac.uk/citizen-science-and-global-biodiversity
Highlights the importance of biodiversity and how anyone can contribute, identify and record wildlife, as a citizen scientist:

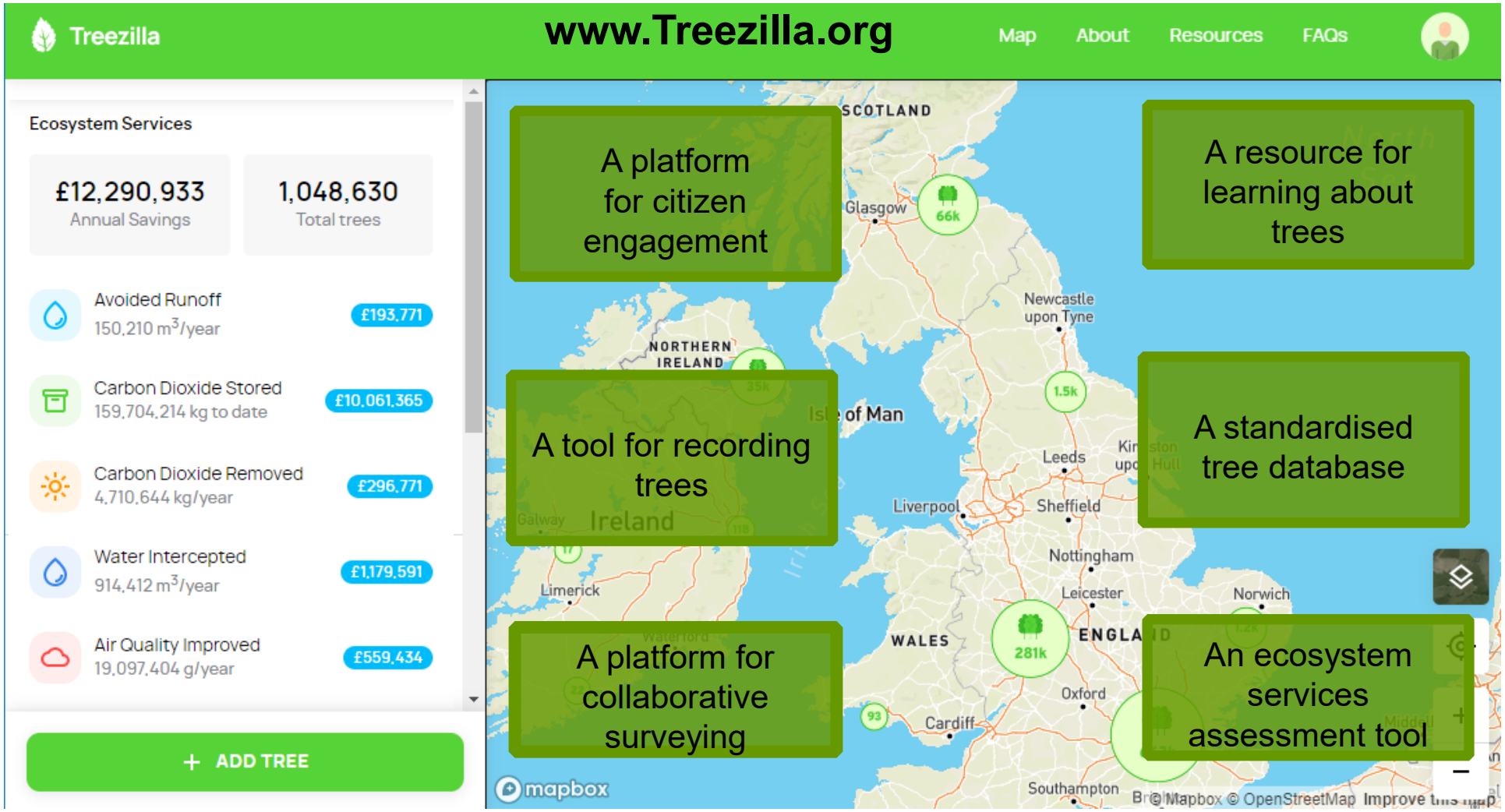
- What is citizen science its growth and link to biological recording
- Scientific research activities as you learn and build individual skills.
- Traditional biological keys and online recording using citizen science techniques
- Practical activities using www.iSpotnature.org
- Using web resources to research species ecology
- The impact of citizen science on biodiversity around the globe.



Participate: join a live, growing online community

- 2.5 million user visits
- 36 million pages viewed / 5 million sessions
- >1.5 million images of >43,000 species
- >806,000 observations
- >9 million identifications
- >2 million agreements with identifications
- >75,000 registered users
- 26,300 registered users added an observation
- 16,400 registered users added an ID
- ~10,000 users added an agreement to an ID
- Reps from >200 expert orgs, schemes & societies
- Hundreds of schools / teachers / representatives

Creating a UK map of trees



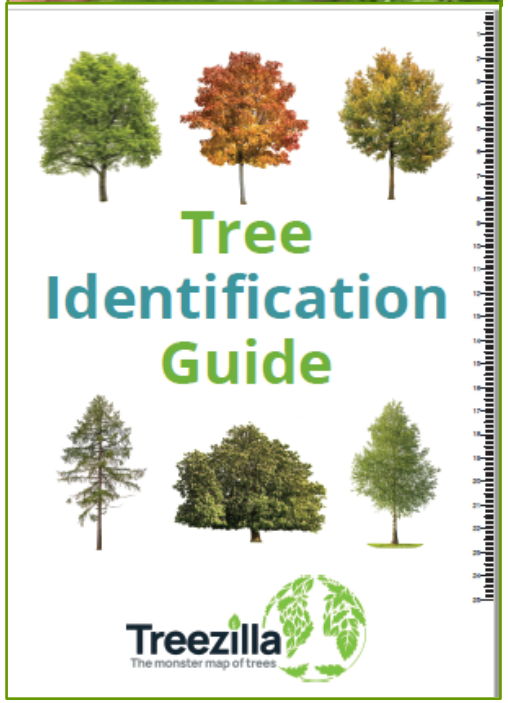
- Helps anyone learn about and map trees around them
- Highlights the role of trees in urban environments and the benefits they provide
- <1% of urban trees (outside woods) are in open maps – aims to fill this gap

Treezilla: contribute to the monster map of trees

Goal: UK's largest open tree map:

- 2013 – ongoing
- Over 1 million tree records
- 1000 registered users
- ~400 active users
- Most add 2-10 trees
- Users: public authorities, Tree Wardens, schools, Universities, public etc
- Records: 98% of records from local authority datasets
- Teaching: e.g. OU students collect local tree data; identify research questions
  - 2018 – 2019 >5000 trees added by >200 OU students

www.Treezilla.org
Treezilla website, App and downloadable tools available!

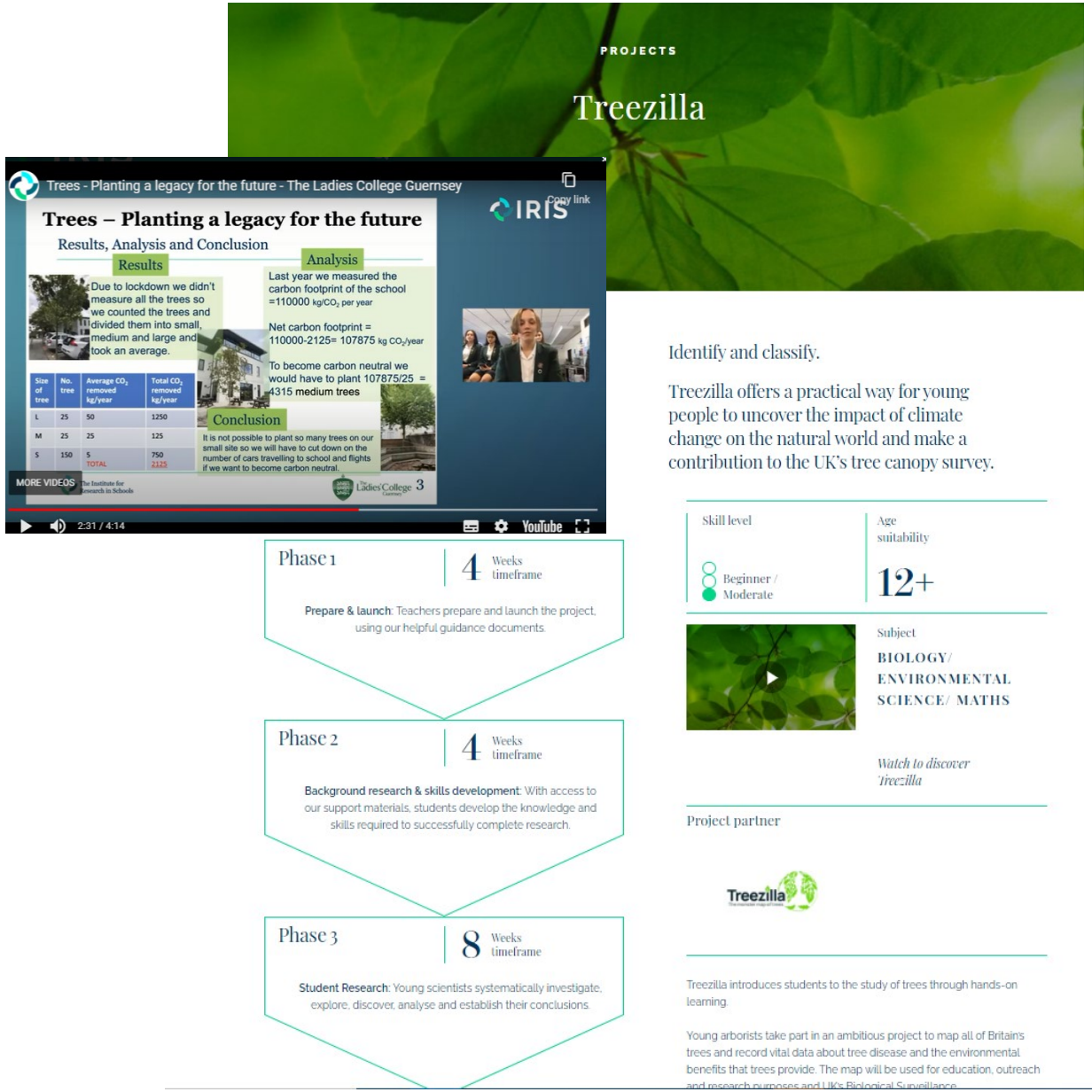


School-based experiences: Student-led research

Collaboration with **the Institute for Research in Schools (IRIS)** https://researchinschools.org/ :

- IRIS develops opportunities for secondary students and post-16s from all backgrounds to participate in authentic research while in school.
- The IRIS Treezilla project offers a practical way for young people to uncover the impact of climate change on the natural world and make a contribution to the UK's tree canopy survey. Builds identification and classification skills, see: https://researchinschools.org/projects/treezilla-2/

- Science teacher encourages students at a girls school aimed at reducing their impact on the environment. Hear more about their experience using Treezilla to record tree data and find out the ecosystem service values: https://researchinschools.org/case-studies/encouragement-in-science-leads-girls-to-become-changemakers-in-guernsey/



X:PolliNation: ideas, methods & technologies for pollinator citizen science

Drivers: **'Cross-pollinating'** ideas about how to improve and expand pollination citizen science tools and approaches **across geographic boundaries** and **stages of the actionable citizen science cycle.**

Aim: **Bringing together** young people, educators, technologists and scientists to learn about and protect pollinators

Where: UK (Hampshire/Sussex) and Italy (Tuscany)

Who:

Funders:

Find us at: www.xpollination.org @XPolliProject #XPolli #PolliPromise

XPolli actionable CS cycle

X-Polli:Nation is an actionable citizen science project designed to create awareness of environmental issues that surround pollinating insects, collect data on their feeding preferences for science, plant habitats to support them and finds novel ways to communicate their importance with a wider community.

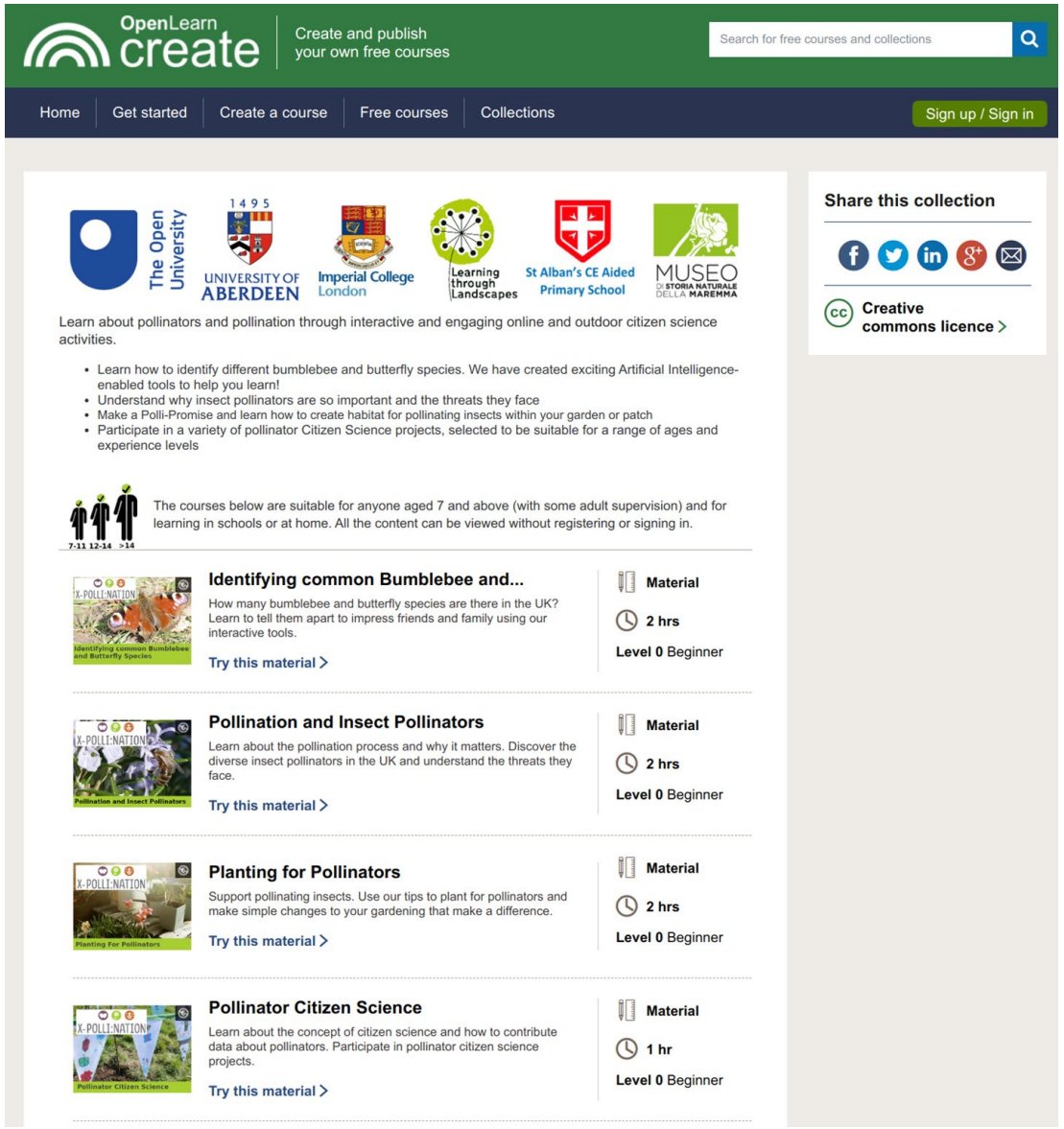
Learn about pollinators

Create or modify habitat in school grounds

Record data about pollinator visits

Share the idea with a Polli-Promise

School-based experiences support: resources for all



Free course: https://www.open.edu/openlearncreate/course/index.php?categoryid=417

- Creative Commons License
- Open Educational Resources (OER)

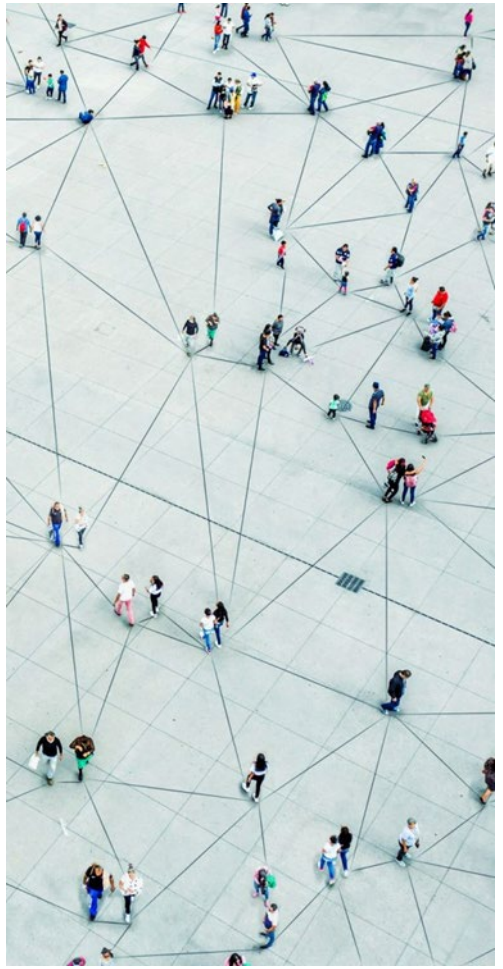
Geared at supporting teachers, see support and resources: https://xpollination.org/teacher-resources/

This project has received funding from the European Union's Horizon 2020 research and innovation programme under grant agreement No 863463

Cos4Cloud, an European project to boost citizen science technologies

cos4cloud-eosc.eu

- Integrate citizen science in the European Open Science landscape
- Provide user-centered and innovative services to the citizen observatories
- Facilitate the networking and knowledge management processes across organizations, people and initiatives working on citizen observatories
- Contribute to ensuring the sustainability of the citizen observatories



COORDINATION: CSIC, Institut de Ciències del Mar
COLOMBIA: Trébola
FRANCE: Inria
GERMANY: ecsa, 52north, Secure Dimensions
GREECE: National and Kapodistrian University of Athens
NETHERLANDS: DDQ Pocket Science
SPAIN: Bineo, CREAF, IFCA, Science for Change
SWEDEN: SLU Swedish Species Information Centre
UNITED KINGDOM: DynAlkon, earthwatch Europe, The Open University

https://cos4cloud-eosc.eu/blog/how-is-cos4cloud-boosting-citizen-science-technologies-watch-the-video/

Cos4Cloud
Co-designing Citizen Observatories Services for the European Open Science Cloud

This project has received funding from the European Union's Horizon 2020 research and innovation programme under grant agreement No 863463

What is a Citizen Observatory?

- Community-based monitoring and information system
- Usually oriented to environmental or biodiversity areas
- Usually embedded in portable or mobile personal devices (sensors, apps)
- Boost citizen engagement and participation
- Focus on improving the management of natural resources (flora, fauna, land)
- Collaborative approach

cos4cloud-eosc.eu

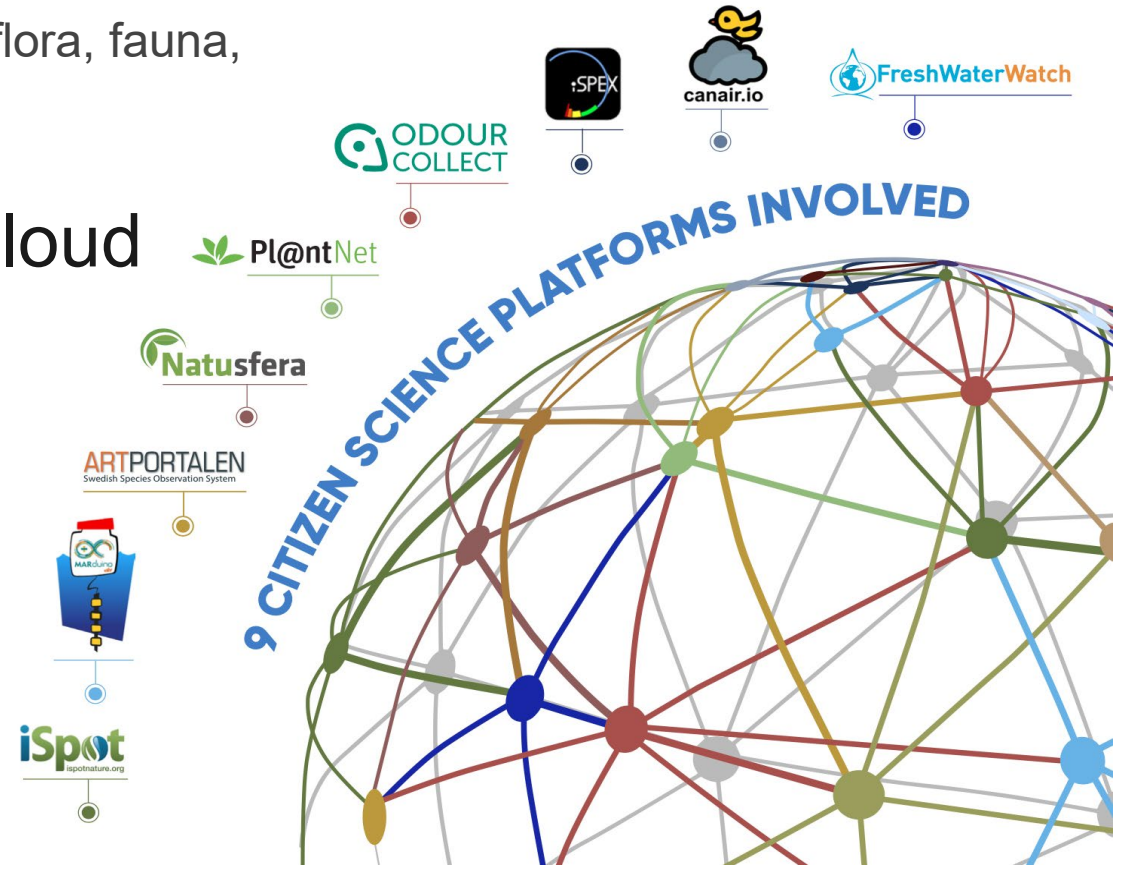
Citizen Observatories involved in Cos4Cloud

Citizen observatories of the biodiversity domain:

- Artportalen
- Natusfera
- iSpot
- Pl@ntNet

Citizen observatories of environmental quality / monitoring domain:

- Water monitoring: FreshWater Watch, KdUINO
- Air monitoring: OdourCollect, CanAir.io and iSpex



* Includes work package focused on: Networking, training, education and capacity building

Cos4Cloud
Co-designing Citizen Observatories Services for the European Open Science Cloud

This project has received funding from the European Union's Horizon 2020 research and innovation programme under grant agreement No 863463

School-based experiences: Cos4Cloud

What do the NKUA course's participants think about the training on citizen science? Read the statements and watch the videos!

The objective of the NKUA online teacher training course was to introduce citizen science to key Greek environmental education stakeholders (teachers, officials and teacher training staff).

biodiversity | Citizen observatories | citizen science | Cos4Cloud | education | education course | environmental education | NKUA | NKUA course

We share all our news and events in our newsletter. Subscribe to stay tuned!

Subscribe now!

Photo: Key Greek environmental education stakeholders (teachers, officials, and teacher training staff) undertook the NKUA online teacher training course online.

Most of the participants had no previous experience with citizen science at all. Nevertheless, **after having undertaken the course, all teachers and educational officials expressed their commitment to get involved with citizen science and implement the educational scenarios** they developed into their school(s) under their responsibility. Some of their evaluative statements:

https://cos4cloud-eosc.eu/blog/citizen-science-education-nkua-course/

Integrating citizen science and Cos4Cloud into a Greek post-graduate course: an inside story

Don't miss the story of Maria Kyriakidou, one of the students!

Citizen observatories | citizen science | Cos4Cloud | education | education course | NKUA | NKUA course | PiSpiritNet | technology

The Environmental Education Lab (EEL) of the National and Kapodistrian University of Athens (NKUA) organised, designed, and led the training course "Citizen Science and Environmental Education for Sustainability" within the Cos4Cloud framework. The objective was to introduce citizen science in the Greek school curriculum. Some of the students have wanted to share with us their experience doing this course. Don't miss the story of Maria Kyriakidou, one of the students!

We share all our news and events in our newsletter. Subscribe to stay tuned!

Subscribe now!

Introducing myself...

Hi! My name is Maria Kyriakidou. I'm a Greek primary school teacher for the last 15 years. I really love my job since it has to do with supporting people, youths in particular, in becoming empowered and help grow citizens of the future. I like poetry, and I've just published my first collection of poems. I am also running an online art and science magazine (Apodyoptes) for the last five years.

Photo: Maria Kyriakidou.

https://cos4cloud-eosc.eu/blog/integrating-citizen-science-and-cos4cloud-into-a-greek-post-graduate-course-an-inside-story/

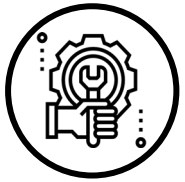
Cos4Cloud
Co-designing Citizen Observatories Services for the European Open Science Cloud

This project has received funding from the European Union's Horizon 2020 research and innovation programme under grant agreement No 863463

Join the Cos4Cloud community!

Co-designing
Create

Panels
Advice



Testing
Use

Join any of our groups and contribute to create the new generation of services for citizen observatories!

Fill this form to join us:
https://cos4cloud-eosc.eu/be-part-of-our-community/

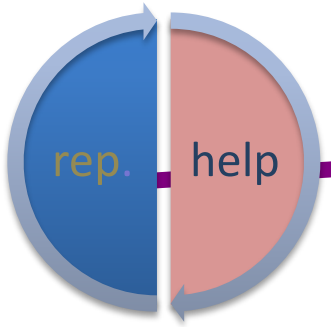
JOIN OUR COMMUNITY!

Keep informed: Follow Cos4Cloud on social media and visit our website: https://cos4cloud-eosc.eu/

Icons made by Eucalyp from www.flaticon.com

iSpot citizen science learning curve

"By focusing on learning, iSpot not only helps participants generate valid scientific observations, but it also trains them to become the biological recorders on whom future data collection will depend."



iSpot
Your place to share nature

Silvertown, J., Harvey, M., Greenwood, R., Dodd, M., Rosewell, J., Rebelo, T., Ansine, J., McConway, K. (2015). Crowdsourcing the identification of organisms: A case-study of iSpot. *ZooKeys*, (480), 125.

CS learning design framed by a 5 step model:

from exploration of nature through to recognised learning actions

Research themes	Learning approaches	iSpotnature.org user community experience / activity	Research review and analysis (examples)
Explore	Social learning	A free online platform - anyone can browse iSpot: analytics data shows users view an average of 9 pages per session with an average session duration of 8 – 10 minutes.	The potential for participant learner engagement from purposive browsing. i.e. iSpot's 'browse observation' search page was the second highest page viewed. (Ansine, et al. 2017) p87.
Identify	Participatory learning	Registered participants can post observations and photos; gather content, share comments and in doing so give and receive help with species identification.	iSpot is described as having a "participatory learning" approach where as an "active participant" the learner engages in activity, developing their interest and passion" (Clow et al, 2011).
Contribute	Experiential learning	iSpot integrates participant rewards and motivation through a bespoke reputation system.	Registered participants gain scores for each of the species groups represented. iSpot gives points and scores for activity and this is the key feature behind how the site works (Silvertown, et al. 2015).
Personalise	Personalised learning	iSpot has tools and features that encourage and facilitate personalisation to meet the participants' interest and pace (i.e. iSpot projects)	iSpot's design is described as one which gives participants control over the learning process (Scanlon et al. 2013) through integrated tools and features. Analysis of iSpot projects indicated that 3,000 were added in the first two years the feature was added (2014 – 2016) developed based on particular interest (Ansine et al. 2017).
Recognition	Active learning	iSpot has integrated and bespoke learning assessment tools i.e. iSpot quizzes; and associated courses. iSpot Quiz data / structured courses projects data	iSpot quizzes were integrated in 2013 as an assessment tool to support evidence of learning. A 2017 study indicated that over 35,000 quizzes were done over a 3-year period (Aug 2013 – Sept 2016). (Ansine et al. 2017). iSpot is also integrated into Open University formal learning and informal courses i.e. OpenLearn.

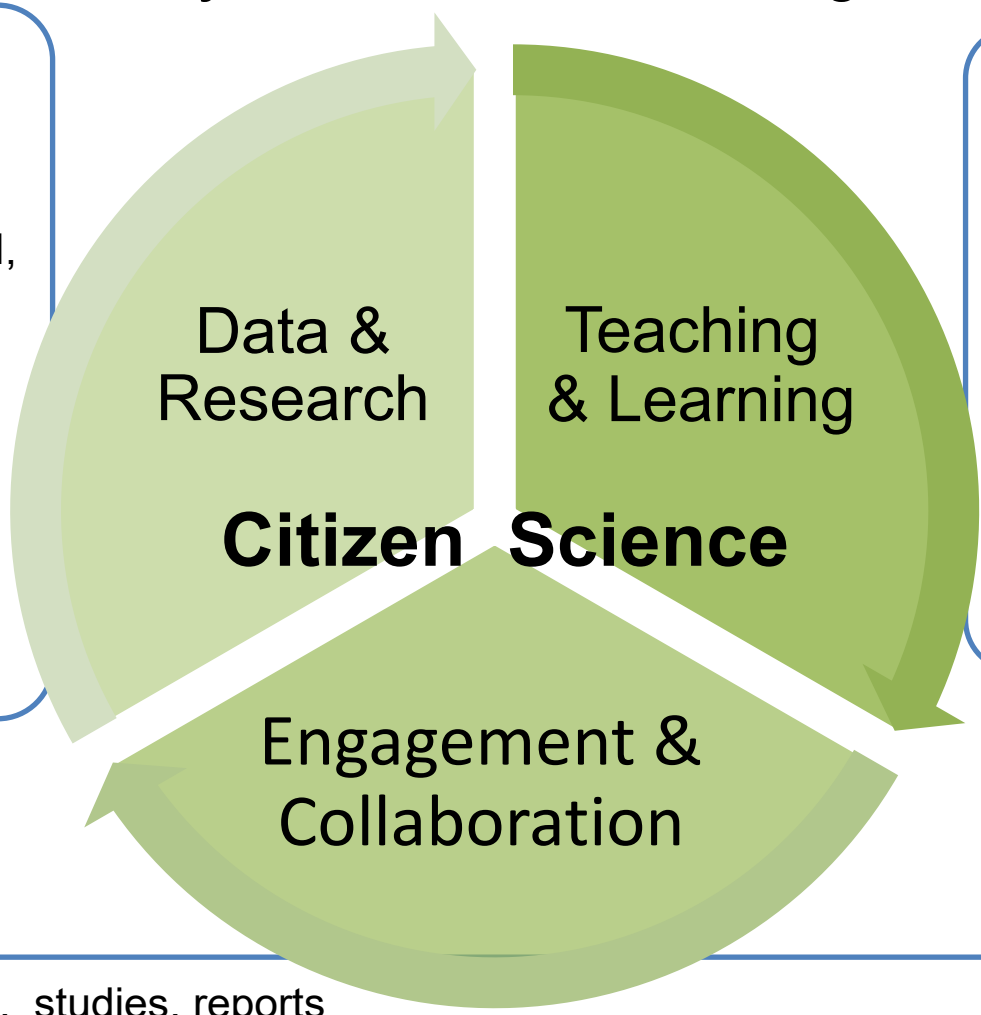
Ansine, Janice (2021). Exploring citizen science learning journeys through iSpotnature.org: an online community of nature lovers. In: *CitSci Virtual 2021, Citizen Science Association (CSA) Conference*, 03-27 May 2021, Online (USA).http://oro.open.ac.uk/78396/

Ansine, J., Dodd, M., Robinson, D., McAndrew, P., (2017) ***Exploring citizen science and inquiry learning through iSpotnature.org.*** *Chapter 6 in Herodotou, C., Sharples, M., Scanlon, E. (eds) Citizen Inquiry: Synthesising citizen science and inquiry learning. Routledge.*

Open University online citizen science learning communities

opportunities for school-based learning

- Data classification, collection & analysis
- Data quality & verification,
- New innovation i.e. AI, machine learning (iSpot / Cos4Cloud)
- Services i.e. ecosystem services valuation (Treezilla)
- Participant analysis / interpretations (new ideas i.e. SENSE project)



- Participatory learning design
- Interactivity - social networks
- Enhanced technology: tools & features i.e. quizzes
- Training, courses
- Educational resources to support classroom learning

iSpot ispotnature.org

Treezilla The monster map of trees

- Publications, studies, reports
  e.g. iSpot - UK State of Nature Report; Treezilla – data standards
- Partnerships / collaborations: local and wider scale i.e. community, national / European / international collaborations & funding
- Public engagement, outreach

Thanks to:
All associated project teams, funders and partners; past and current.

The tens of thousands of citizen scientists, experts and participants, who make these initiatives possible.

And a heartfelt thank you to you all for joining and participating today!

Interested in learning about citizen science? Already a keen nature observer, recorder or citizen scientist? Would you like to have your skills and contributions recognised?
A free Open University (OU) course is available:
www.open.ac.uk/citizen-science-and-global-biodiversity
Complete this course and get an OU Badge  and Statement of Participation!

Contact:
Janice Ansine
Senior Project Manager – Citizen Science
Email: janice.ansine@open.ac.uk

Twitter:
@iSpotnature @treezilla_org
@Cos4Cloud @XpolliProject
@OpenScienceLab @OpenUniversity
@janiceansine

Project websites:
www.iSpotnature.org
www.treezilla.org
www.opensciencelab.ac.uk
https://cos4cloud-eosc.eu
https://xpollination.org